

COMBUSTION PICK-UP ROLLER IN A PRINTING-PLATE EXPOSER

5 Cross-Reference to Related Application:

This application is a continuation of copending International Application No. PCT/DE00/02958, filed August 31, 2000, which designated the United States.

10 Background of the Invention:

Field of the Invention:

The invention relates to the fields of electronic reproduction technology and printing technology and pertains to a device for eliminating combustion residues in an exposers for printing plates.

In an exposers for printing plates, an exposure unit is moved in the axial direction along a rotating drum, on which a printing plate to be exposed is clamped. The exposure unit produces one or more laser beams, which are modulated with image signal values and which expose one or more circumferential lines on the printing plate, pixel by pixel. As a result, the printing plate surface is given the property of subsequently accepting or repelling printing ink at the exposed points in the printing machine, depending on the type of printing plate used. During the exposure of thermal

printing plates, a surface layer present on the printing plate is burned away selectively by the high energy of the laser beams. Thermal printing plates are advantageous because they need no chemical development following exposure, are  
5 environmentally friendly and, immediately after the exposure, can be used for printing.

During the exposure of thermal printing plates, dust-like combustion residues are produced, which can cause various  
10 problems. Combustion residues that get into the exposure path of a laser beam cause energy losses and, as a result, produce exposure faults. After a relatively long operating time, combustion residues can cause all possible unforeseeable functional disruptions as a result of being deposited on  
15 various functional units in the exposure appliance.

Combustion residues that adhere to the exposed printing plate are transferred to a pressure roller used for the unclamping operation during the unclamping of the printing plate from the  
exposer and, when a new printing plate is being clamped by the  
20 same pressure roller, can be transferred to the new printing plate.

According to the prior art, combustion residues are extracted by a suction device, whose suction nozzle is fitted as close  
25 as possible to the rotating drum. However, with such a technique it is not possible to remove the combustion residues

completely, so that faults of the type described can continue to occur.

Summary of the Invention:

5 It is accordingly an object of the invention to provide a combustion pick-up roller in a printing-plate exposer that overcomes the hereinafore-mentioned disadvantages of the heretofore-known devices of this general type and that eliminates combustion residues in an exposer for thermal printing plates with which the removal of the combustion residues is improved considerably so that faults caused by combustion residues can no longer occur.

10 With the foregoing and other objects in view, there is provided, in accordance with the invention, an exposure device for exposing thermal printing plates by selectively burning away a surface of a printing plate, including a plate drum for holding the printing plate, a pressure roller pressing the printing plate onto the plate drum during clamping and  
15 unclamping operations of the printing plate, and a pick-up roller in contact with the pressure roller, the pick-up roller picking up combustion residue adhering to the pressure roller.

20 With the objects of the invention in view, in an exposure device for exposing thermal printing plates by selectively burning away a surface of a printing plate, the exposure

device having a plate drum for holding the printing plates and a pressure roller pressing the printing plate onto the plate drum during clamping and unclamping operations of the printing plate, there is also provided a cleaning device including a pick-up roller in contact with the pressure roller, the pick-up roller picking up combustion residue adhering to the pressure roller.

In accordance with another feature of the invention, the pick-up roller is in direct contact with the pressure roller.

In accordance with a further feature of the invention, the pick-up roller has an adhesive surface picking up combustion residue adhering to the pressure roller.

In accordance with a concomitant feature of the invention, the pressure roller has a non-adhesive surface.

Other features that are considered as characteristic for the invention are set forth in the appended claims.

Although the invention is illustrated and described herein as embodied in a combustion pick-up roller in a printing-plate exposer, it is, nevertheless, not intended to be limited to the details shown because various modifications and structural changes may be made therein without departing from the spirit

of the invention and within the scope and range of equivalents of the claims.

The construction and method of operation of the invention, however, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings.

10 Brief Description of the Drawings:

FIG. 1 is a cross-sectional view of a prior art exposser for thermal printing plates; and

15 FIG. 2 is a cross-sectional view of an exposser for thermal printing plates according to the invention.

Description of the Preferred Embodiments:

Referring now to the figures of the drawings in detail and first, particularly to FIG. 1 thereof, there is shown the

20 basic functioning of an exposser for thermal printing plates according to the prior art. Before the exposure, a printing plate (1) to be exposed is clamped onto a plate drum (2). For such a purpose, the leading edge of the printing plate (1) is fixed on the plate drum (2) by non-illustrated clamps. The  
25 printing plate (1) is then wound onto the plate drum (2) as the plate drum (2) rotates slowly, a pressure roller (3)

pressing the printing plate (1) onto the plate drum (2). At the end of the clamping operation, the trailing edge of the printing plate (1) is fixed onto the plate drum (2) by non-illustrated clamps.

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During the exposure, an exposure head (4) produces one or more laser beams (5) that are modulated with image signal values. The plate drum (2) with the printing plate (1) clamped thereon rotates, and the exposure head (4) moves along in the axial direction on the plate drum (2) so that the printing plate (1) is exposed line by line. The laser beams (5) burn away parts of a surface layer of the printing plate (1) selectively. As a result, the printing plate (1) is given the property of subsequently accepting printing ink at specific points in the printing machine and of picking up no printing ink at the other points. Combustion residues produced during the exposure are extracted and carried away by a suction device (6).

20 Following the exposure, the plate drum (2) is rotated slowly in the opposite direction to unclamp the exposed printing plate (1) again. In the process, the printing plate is guided away from the pressure roller (3) again. The prior art device described has a disadvantage that combustion residues not  
25 extracted and that adhere to the exposed printing plate (1) are transferred to the pressure roller (3) during the

unclamping of the printing plate (1). Then, when a new printing plate is being clamped on, such residues are transferred from the pressure roller (3) onto the new printing plate.

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FIG. 2 shows the functioning of an exposers for thermal printing plates with the device according to the invention. In addition to the pressure roller (3), there is a pick-up roller (7) in contact with the pressure roller (3) and preferably having an adhesive surface. The adhesive surface of the pick-up roller (7) is achieved, for example, by coating with rubber or with silicone material. A further preferred embodiment of the invention is for the pressure roller (3) to be provided with a non-adhesive surface that, for example, is achieved by coating with a smooth plastic film. As a result of the non-adhesive surface of the pressure roller (3), the pressure roller (3) picks up considerably fewer combustion residues adhering to the printing plate (1). The combustion residues that remain adhering to the exposed printing plate (1) do not interfere during printing because they are washed away by the moistening of the printing plate with water and printing ink performed in the printing machine.

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Remaining combustion residues, which nevertheless pass onto the pressure roller (3), are transferred to the pick-up roller (7) by the adhesive surface thereon. Thus, the adhesive

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surface continually cleans the pressure roller (3). Such a configuration substantially decreases, or entirely prevents combustion residues from being transferred to a new printing plate when that new printing plate is being clamped on.